



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: Sanghyun JOO, et al.

Serial No.: 10/029,835

Examiner: Not Yet Assigned

Filed: December 31, 2001

Group Art Unit: 2621

For: ROBUST BLIND WATERMARKING METHOD IN WAVELET DC COMPONENTS.

\* \* \* \* \*

PRELIMINARY AMENDMENT

Honorable Commissioner for Patents  
Washington, D.C. 20231

June 10, 2002

Sir:

Prior to initial examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please amend the second full paragraph on page 11 to read as follows:

Fig. 1 is a concept diagram illustrating a procedure for setting a target domain in which watermarks are to be embedded, in accordance with an embodiment of the present invention;

Please amend the second full paragraph on page 13 to read as follows:

Fig. 1 illustrates a wavelet transform procedure for embedding watermarks in an image in accordance with an embodiment of the present invention.

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Please amend the paragraph bridging page 13 and page 14 to read as follows:

Where it is desired to embed watermarks in a particular image shown in Fig. 1 for protection of the copyright for the image, it is necessary to decompose the original image into wavelets in order to determine domains in which a watermark is to be embedded. That is, an n-level wavelet transform should be performed for the original image, as shown in Fig. 1. The level of wavelet transform determines the size of a DC domain in which a watermark is to be embedded. Accordingly, the wavelet transform level must be appropriately determined so that it prevents a degradation in picture quality caused by the embedding of the watermark. For example, when a DC domain has the same size as its original image, it can allow a maximum number of watermarks to be embedded therein. Generally, where an n-level wavelet transform for an image having M x N size is performed, a domain  $LL_n$  may be determined as a target domain in which a watermark is to be embedded, as shown in Fig. 1 and expressed by Equation 1:

#### **REMARKS**

Due to an inadvertent error, the specification of the above-referenced application describes Figure(s) 1a and 1b when, in fact, Figure(s) 1a and 1b do not exist. The references to

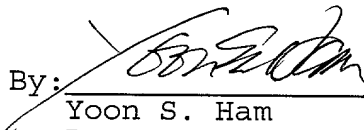
Figure(s) 1a and 1b in the specification are meant for Figure 1.

Attached hereto is a marked-up version of the changes made to the claims by the current Preliminary Amendment. The attached page is captioned "Version with Markings to Show Changes Made."

The foregoing Preliminary Amendment is requested.

Early action on the merits is respectfully requested.

Respectfully submitted,

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Atty. Docket: P67527US0  
YSH:dj

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE SPECIFICATION:**

Please amend the second full paragraph on page 11 as follows:

[Figs. 1a and 1b are] Fig. 1 is a concept [diagrams] diagram [respectively] illustrating a procedure for setting a target domain in which watermarks are to be embedded, in accordance with an embodiment of the present invention;

Please amend the second full paragraph on page 13 as follows:

[Figs. 1a and 1b illustrate] Fig. 1 illustrates a wavelet transform procedure for embedding watermarks in an image in accordance with an embodiment of the present invention.

Please amend the paragraph bridging page 13 and page 14 as follows:

Where it is desired to embed watermarks in a particular image shown in [Fig. 1a] Fig. 1 for protection of the copyright for the image, it is necessary to decompose the original image into wavelets in order to determine domains in which a watermark is to be embedded. That is, an n-level wavelet transform should be performed for the original image, as shown in [Fig. 1b] Fig. 1. The level of wavelet transform determines the size of a DC

domain in which a watermark is to be embedded. Accordingly, the wavelet transform level must be appropriately determined so that it prevents a degradation in picture quality caused by the embedding of the watermark. For example, when a DC domain has the same size as its original image, it can allow a maximum number of watermarks to be embedded therein. Generally, where an  $n$ -level wavelet transform for an image having  $M \times N$  size is performed, a domain  $LL_n$  may be determined as a target domain in which a watermark is to be embedded, as shown in [Fig. 1b] Fig. 1 and expressed by Equation 1: